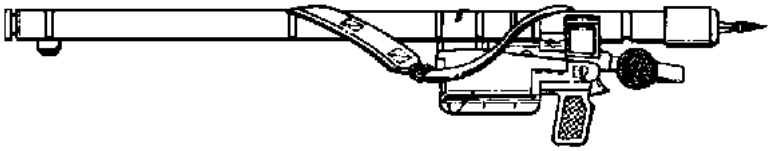
Russian Manportable SAM System SA-16/GIMLET



Weapons & Ammunition Types	Typical Combat Load
Ground mount	**1**
SP Artillery mount	**2**
MANPAD transporter	**5**

SYSTEM
Alternative Designation: 9K310 Igla-1
Date of Introduction: 1986
Proliferation: At least 34 countries

Description:
Crew: 1

ARMAMENT
Launcher
Name: 9P322 launch tube
9P519 launcher gripstock
Dimensions (m):
Length: 1.708
Diameter: 0.08 tube, 0.33 overall
Weight (kg): 7.1
Reaction Time (sec): 5-7 seconds
Time between launches: INA
Reload time (sec): <60

Missile
Name: 9M313
Range (m):
Max. Range: 5,200 receding
4,500 approaching
Min. Range: 600
Altitude (m):
Max. Altitude: 3,500 receding slow
3,000 slow approach
2,500 receding fast
2,000 fast approach
Min. Altitude: 10
Dimensions (mm):
Length: 1,593
Diameter: 72
Weight (kg): 10.8
Missile Speed (m/s): 570
Propulsion: Solid fuel booster and dual-thrust solid fuel sustainer rocket motor.
Guidance: Passive IR homing
Seeker Field of View: 80°
Tracking Rate: INA
Warhead Type: Frag-HE
Warhead Weight (kg): 1.27
Fuze Type: Contact
Self-Destruct (sec): 14-17

FIRE CONTROL
Sights w/Magnification:
Front hooded ring, rear optical
Gunner:
Field of View (°): INA
Acquisition Range (m): INA

IFF: Yes

VARIANTS
Specialized applications include an LUAZ utility carrier designed for a manpads firing unit. The vehicle has a rack for mounting five 9P322 SA-16 launcher tubes. This rack could be used in other manportable AD unit vehicle applications.

Djigit: Russian twin launcher complex mounted on a rail frame with operator's seat and tripod. Missiles can be simultaneously launched using centrally mounted sight. A Hungarian mount with this system on a GAZ-630 4x4 truck is called **Igla-1E**.

Igla-1E: Russian export variant. Unlike the base system, fuel remnants are not fuzed with the warhead. IFF interrogator can be tailored to customer specifications.

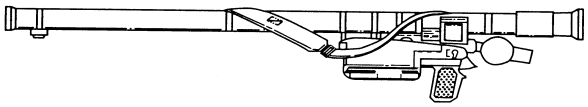
Igla-1M: Export variant similar to -1E, but lacks an IFF interrogator.

NOTES
Launcher deployment time is 5-13 seconds. Missiles are preloaded in the launch tube for quick loading to the gripstock. A tube can be used up to five times. The missile is cooled by a disposable bottle of refrigerant. The bottle and launcher battery are useable for 30 seconds after activation. The ATGM is more vulnerable to EO/IR decoy countermeasures than is the SA-18. Because the nose extends past the launcher tube, the nose is protected with an extended cap, which is removed before launching.

The unusually wide (80°) FOV seeker permits the missile to respond more quickly to fast-maneuver targets, such as helicopters.
Maximum speed for engaged targets varies from 320 m/s rear aspect, receding targets, to 360-400 m/s head-on, approaching targets.

The gunner may have an optional portable electronic plotting board, which warns of location and direction of approaching target(s) with a display range of up to 12.5 km.

Russian Manportable SAM System SA-18/GROUSE



Weapons & Ammunition Types	Typical Combat Load
Ready missiles	**1**

SYSTEM
Alternative Designation: 9K38 Igla
Date of Introduction: 1983
Proliferation: At least 4 countries

Description:
Crew: 1

ARMAMENT
Launcher
Name: 9P39
Dimensions (m):
Length: 1.708
Diameter: INA
Weight (kg): 1.63
Reaction Time (sec): 6-7
Time Between Launches (sec): 16
Reload Time (sec): 10

Missile
Name: 9M39
Range (m):
Max. Range: 6,000
Min. Range: 500
Altitude (m):
Max. Altitude: 3,500
Min. Altitude: 10
Dimensions (mm):
Length: 1,708
Diameter: 70
Weight (kg): 10.6
Missile Speed: Mach 2
Propulsion: Solid fuel booster and dual-thrust solid fuel sustainer rocket motor.
Guidance: Passive IR homing
Seeker Field of View: INA
Tracking Rate: INA
Warhead Type: HE
Warhead Weight (kg): 1.27
Fuze Type: Contact
Self-Destruct (sec): 15

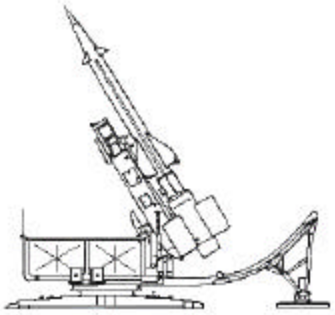
FIRE CONTROL
Sights w/Magnification:
Launcher has fore and rear sights
Gunner:
Field of View (°): INA
Acquisition Range (m): INA

IFF: Yes

VARIANTS
Igla-V: Air-to-air version
Igla-D: Use in airborne forces
Igla-N: Increased lethality
Igla-S: Improved version of Igla-N

NOTES
The SAM gunner is provided information about location and direction of approaching target(s) using a portable electronic plotting board. Two variants (Igla-D and Igla-N) can be separated in two parts for easier portability, but this adds 60 seconds to the reaction time. Igla-N is heavier due primarily to the warhead mass increased to 3.5 kg.

Russian SAM System SA-3/GOA



Weapons & Ammunition Types	Typical Combat Load
Launch rails	**2 or 4**

SYSTEM
Alternative Designations: S-125 Neva, S-125 Pechora (export)
Date of Introduction: Twin launcher 1961/ quadruple launcher 1973.
Proliferation: At least 39 countries

LAUNCHER
Description: Towed twin or quad-rail launcher
Name: INA
Dimensions: INA
Weight (kg): INA
Reaction Time (sec): INA
Time Between Launches (sec): INA
Reload Time (min): 50 (quad launcher)
Fire on Move: No
Emplacement Time (min): 120
Displacement Time (min): 100

ARMAMENT
Missile:
Name: Volga (5V24, 5V27)
Range (m):
Max. Range: 29,000
Min. Range: 6,000
Altitude (m):
Max. Altitude: 25,000
Min. Altitude: 100
Dimensions:
Length (m): 6.10
Diameter (mm): 550
Weight (kg): 946
Missile Speed (m/s): 650-1,150
Velocity (mach): 3.5
Propulsion: Solid fuel booster
Guidance: Command RF
Warhead Type: Frag-HE
Fuze Type: Proximity RF
Warhead Weight (kg): 73

FIRE CONTROL
Radar:
Name: LOW BLOW
Function: Missile Control
Control Range (km): 85
Detection Range (km): 110
Frequency Band: I
Tracking Capability: 6 a/c simultaneously

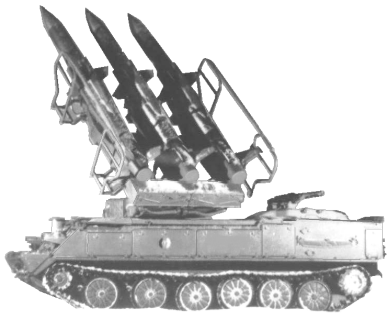
Radar:
Name: FLAT FACE/P-15
Function: Target Acquisition
Detection Range (km): 250
Frequency Band: C

Radar:
Name: SQUAT EYE/P-15M
Function: Target Acquisition (low altitude, instead of FLAT FACE)
Detection Range (km): INA
Frequency Band: C

VARIANTS
SA-3a: Two-rail launcher. Missiles without interstage fins.
SA-3b (GOA Mod 1): Two-rail launcher. Missiles have interstage fins.
SA-3c: Four-rail launcher.
S-125 Pechora: Export version
SA-N-1: Naval version

NOTES
The SA-3/GOA is a two-stage, low- to medium-altitude SAM. Two ready missiles travel in tandem on a modified truck or tracked vehicle from which the crew loads the missiles onto a ground-mounted, trainable launcher for firing. The truck-mounted FLAT FACE radar acquires the targets, while the LOW BLOW radar carries out the fire control function. It is principally a point/small area defense weapon. The SA-3 system is not mobile. It is movable, but its displacement time is considerable.

Russian SAM System SA-6/GAINFUL



Weapons & Ammunition Types	Typical Combat Load
Launch rails	**3**

SYSTEM
Alternative Designations: Kub, Kvadral
Date of Introduction: 1966
Proliferation: At least 22 countries

Description:
Crew: 3
Combat Weight (mt): 14
TEL Chassis: Modified PT-76
Length (m): 6.09
Height (m): 4.45
Width (m): 3.04

Automotive Performance:
Engine Name, Type: V-6R, 6 cyl diesel
Cruising Range (km): 250
Speed (km/h):
Max. Road: 45
Max. Swim: N/A

Radio: INA

Protection:
NBC Protection System: Yes

ARMAMENT
Launcher:
Name: 2P25
Reaction Time (min): INA
Time Between Launches (sec): INA
Reload Time (min): 10
Fire on Move: No
Emplacement Time (min): 5 or less
Displacement Time (min): INA

Missile:
Name: 3M9, 9M9
Range (m):
Max. Range: 25,000
Min. Range: 4,000
Altitude (m):
Max. Altitude: 15,000
Min. Altitude: 50
Dimensions:
Length (m): 6.20
Diameter (mm): 335
Weight (kg): 599
Missile Speed: Mach 2.7
Propulsion: Solid fuel
Guidance: Semiactive radar homing
Warhead Type: Frag HE
Fuze Type: Proximity RF
Warhead Weight (kg): 50

FIRE CONTROL
Sights w/Magnification: EO sighting system on vehicle. Commander and driver have IR.

IFF: Pulse-doppler

Radar:
Name: STRAIGHT FLUSH
Function: Fire Control /Target Acquisition
Detection Range (km): 60-90
Tracking Range (km): 28
Frequency: I-low altitude (tracking); G/H-med altitude (acquisition); H (detection)

Radar:
Name: LONG TRACK
Function: Battlefield Surveillance/Target Acquisition
Detection Range (km): 167
Tracking Range (km): 150
Frequency: 2.6 GHz
Frequency Band: E

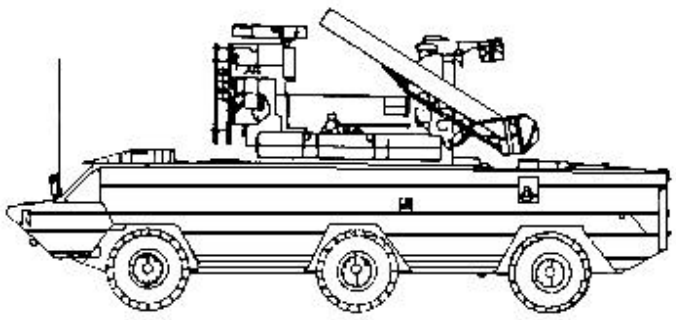
Radar:
Name: THIN SKIN
Function: Height Finding
Detection Range (km): 240
Tracking Range (km): INA
Frequency Band: H

VARIANTS
SA-6b/GAINFUL: Mounted on MT-LB, has integrated radar. The TELAR can operate independently for surveillance.

NOTES
The SA-6 is a two-stage, solid-fuel, low-altitude SAM. It has radio-command guidance with semiactive radar terminal homing. Targets are low to medium altitude fixed- and rotary-wing aircraft. Two or more missiles may be launched at a target during an engagement. The associated STRAIGHT FLUSH fire control/target acquisition radar vehicle uses the same chassis as the SA-6a TEL. The LONG TRACK target acquisition radar is also associated with the SA-6 system. The LONG TRACK surveillance radar acquires target data, the STRAIGHT FLUSH missile site radars take over target acquisition and fire control.

SA-6 regiments organic to mechanized and tank divisions consist of 20 TELs in five batteries, 4 TELs to a battery. The SA-6b system includes the FIRE DOME fire control radar. When the SA-6a TEL battery is replaced with an SA-6b TELAR, the battery doubles its capability to acquire and engage targets. Each battery has four triple launchers, one STRAIGHT FLUSH vehicle, and two reload vehicles (3 missiles each). Normally, three of these batteries are deployed approximately 5 km behind the front line; the remaining two are deployed about 10 km farther back, filling the gaps between the three forward batteries.

Russian SAM System SA-8b/GECKO



Weapons & Ammunition Types	Typical Combat Load
SA-8b in canisters	**6**

SYSTEM
Alternative Designations: 9K33M3 Osa-AKM
Date of Introduction: 1980
Proliferation: At least 25 countries

Description:
Crew: 3
Combat Weight (mt): 9
TELAR: BAZ-5937 6x6 amphibious cross-country capable vehicle
Length (m): 9.14
Height (m): 4.2 (with surveillance radar folded down)
Width (m): 2.75

Automotive Performance:
Engine Type: D20K300 diesel
Cruising Range (km): 500
Speed (km/h):
Max. Road: 80
Max. Swim: 8

Radio: R-123M

Protection:
NBC Protection System: Yes

ARMAMENT
Launcher:
Name: 9P35M2
Dimensions:
Length (m): 3.2
Diameter (mm): INA
Weight (kg): 35
Reaction Time (sec): INA
Time Between Launches (sec): 4
Reload Time (min): 5
Fire on Move: No
Emplacement Time (min): 4
Displacement Time (min): Less than 4 (est.)

Missile:
Name: 9M33M3
Range (m):
Max. Range: 15,000
Min. Range: 200
Altitude (m):
Max. Altitude: 12,000
Min. Altitude: 10
Dimensions (mm):
Length: 3,158
Diameter: 209.6
Weight (kg): 170
Missile Speed (m/s): 1020
Propulsion: Solid propellant rocket motor
Guidance: RF CLOS
Warhead Type: Frag-HE
Fuze Type: Contact and proximity
Warhead Weight (kg): 16
Self-Destruct (sec): 25-28

FIRE CONTROL
Sights w/Magnification: INA
LLLTV/optical assist (for target tracking in low visibility and heavy ECM)

IFF: Yes

Radar:
Name: LAND ROLL
Function: Target Acquisition
Detection Range (km): 20-30
Tracking Range (km): 20-25
Frequency: 6-8 GHz
Frequency Band: H

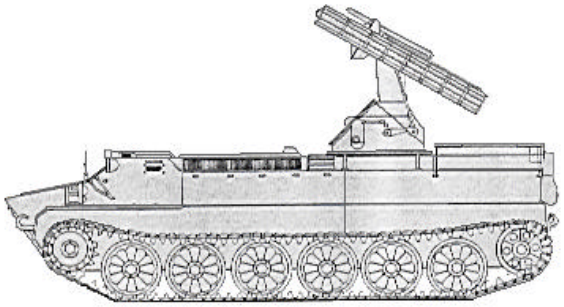
Radar:
Name: Monopulse Target Tracking Radar
Function: Target Tracking
Detection Range (km): 20-25
Tracking Range (km): INA
Frequency: 14.2-14.8 GHz
Frequency Band: J

2 Missile tracking radars:
Frequency: 10-20 GHz

VARIANTS
SA-8a: Initial production model that carries four missiles on exposed rails.
4K33 Osa-M (SA-N-4): Naval variant

NOTES
The first production version of this system was identified as SA-8a, which only had 4 launcher rails and exposed missiles. The SA-8b typically has two BAZ-5937 resupply/transloader vehicles, carrying 18 missiles each (boxed in sets of three) that supports a battery of four TELARs. A target can be brought under fire both with one missile as well as a volley of two missiles. This system is also air transportable.

Russian SAM System SA-13b/GOPHER



Weapons & Ammunition Types	Typical Combat Load
9M333 missiles	**8**
Ready	4
Reload	4
7.62-mm MG RPK	INA

SYSTEM
Alternative Designations: Strela-10M3, 9K35M3
Date of Introduction: 1981
Proliferation: At least 22 countries

Description:
Crew: 3
TELAR: 9A34M3 or 9A35M3 vehicle
Chassis: MT-LB
Combat Weight (mt): 12.3
Length (m):
Launch position: 6.45
Travel position: >6.45
Height (m):
TAR up: 3.8
TAR down: 2.22
Width (m): 2.85

Automotive Performance:
Engine Type: V-8 diesel
Cruising Range (km): 500
Speed (km/h):
Max. Road: 61.5
Max Swim: 6

Radio: INA

Protection:
NBC Protection System: Yes

ARMAMENT
Launcher:
Name: INA
Dimensions: INA
Length (m): INA
Diameter (mm): INA
Weight (kg): INA
Reaction Time (sec): 7-10
Time Between Launches (sec): <5
Reload Time (min): 3
Fire on Move: No, stop or short halts
Emplacement Time (min): 0.67
Displacement Time (min): <1.0

Missile:
Name: 9M333
Range (m):
Max. Range: 5,000-7,000
Min. Range: 800
Altitude (m):
Max. Altitude: 3,500
Min. Altitude: 10
Dimensions (mm):
Length: 2,223
Diameter: 120
Weight (kg): 42
Missile Speed (m/s): Up to 800/517 average
Propulsion: Single-stage solid propellant
Guidance: Photo contrast or dual IR homing
Warhead Type: HE with fragmenting rod
Fuze Type: Laser proximity/contact
Warhead Weight (kg): 5
Self-Destruct (sec): 29

Auxiliary Weapon:
Caliber, Type, Name: 7.62-mm MG, RPK
Rate of Fire (rd/min): 150 practical
600 cyclic, in bursts
Loader Type: 40/75-rd magazine
Ready/Stowed Rounds: INA
Elevation (°): INA
Fire on Move: Yes

FIRE CONTROL
Sights w/Magnification:
Electro-optical/Infrared system:
Range: INA

IFF: 1RL246-10-2/PIE RACK (RF)

Radar:
Name: 9S86/SNAP SHOT
Function: Range only
Detection Range (km): 10
Tracking Range (km): N/A
Frequency: INA
Frequency Band: INA

VARIANTS
Missile Variants: Strela-10M has uncooled lead sulphide (PbS) IR seeker. **Strela-10M2** has uncooled PbS seeker or cooled indium antimonide Mid-IR single-mode seeker.

Czech SNAP SHOT radar: Version with height adjustment capability, and improved automation and communications

SAVA: Yugloslav variant of Strela-10M/ SA-13a on a BVP M80A IFV chassis.

Strijela-10Croal: Croatian variant with a TAM 150.B 6x6 vehicle chassis, TV-based fire control and thermal night sight.

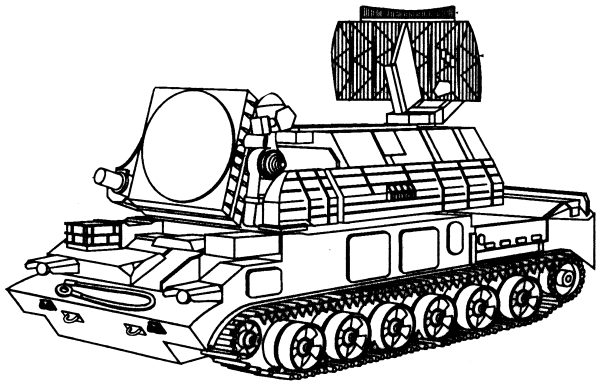
NOTES
Associated equipment includes a 9V915M maintenance vehicle, 9I11 external power supply system, and a 9V839M test vehicle. The DOG EAR battery acquisition radar has an MT-LBu tracked chassis, operates in F and G band, and provides 80 km detection and 35 km tracking.

The battery set uses centralized digital target warning net; but each launcher must individually acquire and launch against targets. One of the four launchers (9A35M/TELAR-1) has a 9S16/FLAT BOX -B passive radio DF system (range to 30 km). In a battery set, the TELAR-1 can pass data to the other launchers (9A34M/TELAR-2). The TELARs have a gasoline-powered APU.

The launcher module can be installed on other vehicles, such as BRDM-2. The launcher permits electro-mechanical aiming, and lock-on automatic slewing to track target. Launcher elevation (°) is -5 to +80 . Maximum target speed is 420 m/s.

The MT-LB hull offers only 7 mm of protection, versus twice that for the SA-9 BRDM-2. However, the SA-13 tracked chassis improves mobility, increasing capability for dispersion and survivability. The SA-13 can launch SA-9 SAMs, and can mix the SAMs.

Russian SAM System SA-15b/GAUNTLET



Weapons & Ammunition Types	Typical Combat Load
Ready missiles	**8**

SYSTEM
Alternative Designations: 9K331 Tor-M1
Date of Introduction: 1990
Proliferation: At least 5 countries

Description:
Crew: 3
TLAR: 9A331 combat vehicle
Chassis: GM-355
Combat Weight (mt): 34
Length (m): 7.5
Height (m): 5.1 (TAR up)
Width (m): 3.3

Automotive Performance:
Engine Type: V-12 diesel
Cruising Range (km): 500
Speed (km/h):
Max. Road: 65

Radio: INA

Protection:
NBC Protection System: Yes

ARMAMENT
Launcher:
Name: INA
Dimensions: INA
Length (m): INA
Diameter (mm): INA
Weight (kg): INA
Reaction Time (sec): 5-8
Time Between Launches (sec): (see NOTES)
Reload Time (min): 10
Fire on Move: Yes
Emplacement Time (min): 5
Displacement Time (min): Less than 5

Missile:
Name: 9M331
Range (m):
Max. Range: 12,000
Min. Range: 100
Altitude (m):
Max. Altitude: 6,000
Min. Altitude: 10
Dimensions (mm):
Length: 2,900
Diameter: 235
Weight (kg): 167
Missile Speed (m/s): 850
Propulsion: INA
Guidance: Command
Warhead Type: Frag-HE
Fuze Type: RF Proximity
Warhead Weight (kg): 15
Self-Destruct (sec): INA

FIRE CONTROL
Sights w/Magnification:
Electro-optical (EO) television system
Range: 20 km

IFF: Yes

Radar:
Name: INA
Function: Target Acquisition
Detection Range (km): 25
Tracking Range (km): INA
Frequency: INA
Frequency Band: H-band Doppler

Radar:
Name: INA
Function: Target Tracking and Guidance
Detection Range (km): INA
Tracking Range (km): 25
Frequency: INA
Frequency Band: K-band Doppler, Phased Array

VARIANTS
SA-N-9: Naval version

NOTES
SA-15b is designed to be a completely autonomous air defense system (at division level), capable of surveillance, command and control, missile launch and guidance functions from a single vehicle. The basic combat formation is the firing battery consisting of four TLARs and the Rangir battery command post. The TLAR carries eight ready missiles stored in two containers holding four missiles each. The SA-15b has the capability to automatically track and destroy 2 targets simultaneously in any weather and at any time of the day.